

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A G-protein fusion receptor comprising
 - a) an extracellular domain comprising an extracellular domain amino acid sequence substantially similar to either an extracellular CaR amino acid sequence, an extracellular mGluR amino acid sequence, or an extracellular GABA_B receptor amino acid sequence;
 - b) a transmembrane domain joined to the carboxy terminus of said extracellular domain, said transmembrane domain comprising a transmembrane domain amino acid sequence substantially similar to either a transmembrane CaR amino acid sequence, a transmembrane mGluR amino acid sequence, or a transmembrane GABA_B receptor amino acid sequence;
 - c) an intracellular domain joined to the carboxy terminus of said transmembrane domain comprising all or a portion of an intracellular amino acid sequence substantially similar to either an intracellular CaR amino acid sequence, an intracellular mGluR amino acid sequence, or an intracellular GABA_B receptor amino acid sequence, provided that said portion is at least 10 amino acids;
 - d) an optionally present linker joined to the carboxy terminus of said intracellular domain; and
 - e) a G-protein joined either to said intracellular domain or to said optionally present linker, provided that said G-protein is joined to said optionally present linker when said optionally present linker is present,
wherein said intracellular domain when present in a wild type receptor does not interact with said G-protein.
2. (Currently amended) The G-protein fusion receptor of claim 1, wherein said extracellular domain consists of said extracellular domain amino acid sequence, said transmembrane domain consists of said transmembrane domain amino acid sequence; and said intracellular domain consists of said intracellular transmembrane domain amino acid sequence.

3. (original) The G-protein fusion receptor of claim 2, wherein said optionally present linker is present and is a polypeptide 3 to 30 amino acids in length.

4. (original) The G-protein fusion receptor of claim 2, wherein said optionally present linker is not present.

5. (previously presented) The G-protein fusion receptor of claim 3, wherein said G-protein is selected from the group consisting of: $G_{\alpha 15}$, $G_{\alpha 16}$, $Gqo5$, and $Gqi5$.

6. (previously presented) The G-protein fusion receptor of claim 5, wherein any of said CaR sequence present is a human CaR sequence, any of said mGluR sequence present is from a human mGluR, and any of said $GABA_B$ receptor sequence present is from human $GABA_B$ receptor.

7. (previously presented) A nucleic acid comprising a nucleotide sequence encoding for the G- protein fusion receptor of any one of claims 1-6, 42, or 43.

8. (previously presented) An expression vector comprising a nucleotide sequence encoding for the G-protein fusion receptor of any one of claims 1-6, 42, or 43 transcriptionally coupled to a promoter.

9. (previously presented) A recombinant cell comprising the expression vector of claim 8 and a cell wherein the G-protein fusion receptor is expressed and is functional.

10. (previously presented) A recombinant cell produced by combining a vector of claim 8, wherein said vector comprises the nucleic acid of claim 7 and elements for introducing heterologous nucleic acid into a cell wherein the G-protein fusion receptor is expressed, and said cell.

11. (previously presented) A process for the production of a G-protein fusion receptor comprising:

growing prokaryotic or eukaryotic host cells comprising a nucleic acid sequence expressing the G-protein fusion receptor of any one of claims 1-6, 42, or 43, under suitable nutrient conditions allowing for cell growth.

12-41. Canceled.

42. (previously presented) The G-protein fusion receptor of claim 4, wherein said G-protein is selected from the group consisting of: G_{α15}, G_{α16}, Gqo5, and Gqi5.

43. (previously presented) The G-protein fusion receptor of claim 42, wherein any of said CaR sequence present is a human CaR sequence, any of said mGluR sequence present is from a human mGluR, and any of said GABA_B receptor sequence present is from human GABA_B receptor.

44. (previously presented) The G-protein fusion receptor of claim 1, wherein said intracellular domain has at least 90% sequence identity with a portion of a CaR intracellular domain sequence at least 50 amino acids in length.

45. (currently amended) The G-protein fusion receptor of claim 1, wherein said intracellular domain has at least 90% sequence identity with a portion of a MrluR mGluR intracellular domain sequence at least 50 amino acids in length.

46. (previously presented) The G-protein fusion receptor of claim 1, wherein said intracellular domain has at least 90% sequence identity with a portion of a GABA_B receptor intracellular domain sequence at least 50 amino acids in length.

47. (New) The G-protein fusion receptor of claim 1, wherein said extracellular domain and said transmembrane domain have at least 75% sequence identity with an mGluR extracellular domain and transmembrane domain or a GABA_B receptor extracellular domain and transmembrane domain, said intracellular domain has at least 75% sequence identity with a CaR intracellular amino acid sequence, and said G-protein couples to phospholipase C.

48. (New) The G-protein fusion receptor of claim 47, wherein said extracellular domain and said transmembrane domain are from a Type 2 mGluR.

49. (New) The G-protein fusion receptor of claim 47, wherein said extracellular domain and said transmembrane domain are from a Type 3 mGluR.

50. (New) The G-protein fusion receptor of claim 47, wherein said extracellular domain and said transmembrane domain are from a Type 4 mGluR.

51. (New) The G-protein fusion receptor of claim 47, wherein said extracellular domain and said transmembrane domain are from a Type 6 mGluR.

52. (New) The G-protein fusion receptor of claim 47, wherein said extracellular domain and said transmembrane domain are from a Type 7 mGluR.

53. (New) The G-protein fusion receptor of claim 47, wherein said extracellular domain and said transmembrane domain are from a Type 8 mGluR.

54. (New) The G-protein fusion receptor of claim 47, wherein said extracellular domain and said transmembrane domain are from a GABA_B receptor.

55. (New) The G-protein fusion receptor of claim 1, wherein said G-protein is a chimeric G-protein.

56. (New) The G-protein fusion receptor of claim 47, wherein said G-protein is a chimeric G-protein.

57. (New) A G-protein fusion receptor comprising

a) an extracellular domain comprising an extracellular domain amino acid sequence at least 90% identical to an extracellular mGluR amino acid sequence;

b) a transmembrane domain joined to the carboxy terminus of said extracellular domain, said transmembrane domain comprising a transmembrane domain amino acid sequence at least 90% identical to a transmembrane mGluR amino acid sequence, or a transmembrane CaR amino acid sequence;

c) an intracellular domain joined to the carboxy terminus of said transmembrane domain comprising all or a portion of an intracellular amino acid sequence at least 90% identical to an intracellular CaR amino acid sequence, provided that said portion is at least 10 amino acids;

d) an optionally present linker joined to the carboxy terminus of said intracellular domain; and

e) a G-protein joined either to said intracellular domain or to said optionally present linker, provided that said G-protein is joined to said optionally present linker when said optionally present linker is present.

58. (New) The fusion receptor of claim 57, wherein said transmembrane domain comprises a transmembrane domain amino acid sequence at least 90% identical to a transmembrane mGluR amino acid sequence.

59. (New) The fusion receptor of claim 57, wherein said transmembrane domain comprises a transmembrane domain amino acid sequence at least 90% identical to a transmembrane CaR amino acid sequence.

60. (New) A G-protein fusion receptor comprising

- a) an extracellular domain comprising an extracellular domain amino acid sequence at least 90% identical to an extracellular GABA_B receptor amino acid sequence;
- b) a transmembrane domain joined to the carboxy terminus of said extracellular domain, said transmembrane domain comprising a transmembrane domain amino acid sequence at least 90% identical to either a transmembrane CaR amino acid sequence, or a transmembrane GABA_B receptor amino acid sequence;
- c) an intracellular domain joined to the carboxy terminus of said transmembrane domain comprising all or a portion of an intracellular amino acid sequence at least 90% identical to an intracellular CaR amino acid sequence, provided that said portion is at least 10 amino acids;
- d) an optionally present linker joined to the carboxy terminus of said intracellular domain; and
- e) a G-protein joined either to said intracellular domain or to said optionally present linker, provided that said G-protein is joined to said optionally present linker when said optionally present linker is present.

61. (New) The fusion receptor of claim 60, wherein said transmembrane domain comprises a transmembrane domain amino acid sequence at least 90% identical to a transmembrane GABA_B receptor amino acid sequence.

62. (New) The fusion receptor of claim 60, wherein said transmembrane domain comprises a transmembrane domain amino acid sequence at least 90% identical to a transmembrane CaR amino acid sequence.